



## Knowledge and Perception Among Rural Adults toward Passive Smoking Exposure on Children - A Case Study from Bangladesh

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### ABSTRACT

**Background:** Exposure of passive smoking is a key public health issue around the world. The goal of the study was to find out the knowledge and perception among adults towards passive smoking exposure on children in the rural communities of Bangladesh. **Methods:** A descriptive survey was conducted through a self-administrative questionnaire among six villages of Munshiganj District of Bangladesh. A multistage sampling method was used and a total of 410 both smokers and non-smoker's adult males and females participated in the study. Basic socio-demographic characteristics descriptive, statistics were described. Knowledge and perception were analyzed and presented by frequencies, percentages and using a chi-square test. The overall score for each item was presented by means and standard deviations. All analyses were completed at  $\alpha = 0.05$  to test the differences between variables. **Results:** Among knowledge items, four variables included; exposer of healthy child on tobacco smoke does not have any effect (p-value=0.019), tobacco smoke exposure causes cancer (p-value=0.048), little exposure has no harm to a child (p-value=0.045), and public smoking is ban in Bangladesh (p-value=0.006) showed a significant difference with exposure and non-exposure of passive smoking. Whereas, for a perception, only a variable indicated law on smoking banning inside home (p-value=0.041) was found significant difference with exposure of passive smoking. **Conclusion:** An appropriate health promotion intervention needs to be implemented further which will help to reduce the exposure rate of passive smoking among children.

**Keywords:** Bangladesh, Children, Knowledge, Perception, Passive smoking

### Introduction

Passive smoking exposure is an important public health problem and the exposure is a cause of huge numbers of death each year [1]. Though passive smoking affects humans of every age, children are especially vulnerable for this exposure [2] and the prevalence is significantly high in both developed and underdeveloped countries [3, 4].

There is a significant health effect on children due to exposure to passive smoking. The exposure causes respiratory problems such as asthma, coughing, wheezing as well as lower respiratory infection. The exposure also triggers ear infection, allergic rhinitis, and dermatitis. Different types of cancer also cause by this exposure [5, 6].

The prevalence of passive smoking among children is potential public health concerns as it was estimated that 41% of children were exposed to secondhand smoking in the United Kingdom, whereas in Australia, it was 43%, 33% in Canada and 12%-34% in the USA.

The highest prevalence was 89% in Turkish children [3]. For age above 15 years children, the prevalence was also calculated in Indonesia, which was 80%, while 75% in Vietnam, and 67% in China [4].

Knowledge and perception are two important factors that influence to adopt a healthy behavior [7]. Knowledge is the skill and expertise acquired by an individual through experience or education [8]. Perception is the method by which humans interpret and organize sensations to produce an expressive experience of the world. Perceptions of health also may define as subjective ratings by the affected individual of individual's health status [8, 9].

In Bangladesh, due to the low price and easy availability, the prevalence of tobacco smoking is high [1]. The prevalence of passive smoking among children is also high in both rural and urban areas [10, 11]. Additionally, household smoking is more common in rural area rather than urban area [12]. Despite of having a huge prevalence of passive smoking in South Asia and

South East Asia region, there are very few studies regarding exposure to passive smoking focusing on the child. The prevalence is 38.7% in India and in Myanmar 39.1% and both of these countries shared border with Bangladesh [13, 14]. Having knowledge and perception on passive smoking exposure is essential for behavior change. To our knowledge, in Bangladesh, no study before measured the knowledge and perception of passive smoking exposure on children. The study aimed to find out the knowledge and perception of passive smoking exposure on children in the rural adult communities of Bangladesh thus help to explore the outcome in neighboring countries as well.

**Methods**

*Study Design and Sampling*

A descriptive survey had been carried out in six villages of Munshiganj district, Bangladesh from July to October 2018. The multistage sampling method was used to select the villages and the samples. At first, Munshiganj district had been selected through lottery method of simple random sampling from 61 districts of Bangladesh excluding the hilly districts as the ethnic background of the population is different in the hilly area [15]. Then, three sub-districts of Munshiganj district, two unions from each sub-district and one village from each union had been selected through simple random sampling (lottery method). Later, participants from every third household from the selected villages had been nominated through systematic random sampling (Figure 1).

The targeted populations were both smoker and non-smoker adult male and female of the Munshiganj District of Bangladesh. The total population of the research area was 1,502,449. By using Cochran’s formula, 384 respondents had been selected initially. [16]. However, we have taken 10% extra samples and after data cleaning, a 410 samples were finally selected considering the inclusion criteria which was male and female smoker or non-smoker having at least one child in the household. All subjects provided informed consent before participation.

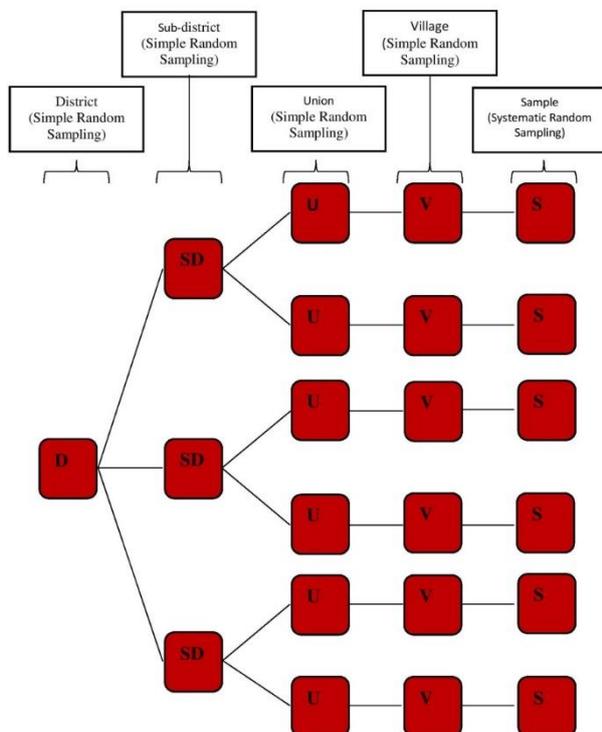
*Data Collection*

A close-ended self-administrative questionnaire containing four sections including demographics, exposure of passive smoking, knowledge, and perception of passive smoking exposure used to collect the data. Demographic variables consisted of gender, age, education, marital status, religion, occupation, and family income. Exposure of passive smoking indicated as exposure to another person’s tobacco smoke in the household more than one day every week for at least 15 minutes daily in the past 30 days [17]. For each answer, a score of 1 (exposed) or 0 (non-exposed) was given. Knowledge was assessed with 9 items true or false questions containing harm, health and, the law of smoking. For each answer, a score of 1 (true) or 0 (false) was given. The perception was measured with 5 items by 3 Likert scale points (3 points for agreeing, 2 points for neutral and, 1 point for disagreeing) [18].

The quality of the research tool was measured by item objective congruence (IOC) and Cronbach’s alpha coefficient. For IOC, three experts from the tobacco filed were selected. Both IOC and the overall Cronbach’s alpha were calculated as 0.87 and 0.76, respectively which qualified the acceptable criteria [19, 20]. The questionnaire was distributed and collected by the principal researcher. Bengali (National language of Bangladesh) was used as the language of the questionnaire. The study was approved by the Institutional Review Board of Naresuan University, Thailand (COA No. 675/2018, IRB No.0502/61).

*Statistical Analysis*

The data were analyzed using SPSS version 20 for Windows (IBM Corp., Armonk, NY). To describe basic socio-demographic characteristics, descriptive statistics were used. Knowledge was analyzed and presented by frequencies and percentages. Chi-square test used to compare the proportion of correct knowledge and exposure or non-exposure of passive smoking. Assessment of perception was also carried out by percentages, frequencies and, using a Chi-square test. The overall score for each item was presented by means and standard deviations. All analyses were completed at a 5% level of statistical significance.



**Figure 1** Sampling technique

respondents. Furthermore, exposers of healthy child on

**Table 1** Socio-demographic and socio-economic characteristics of the sample according to passive smoking exposure (n=410)

Characteristics	n	% of n	Expose (%)	Non-expose (%)	P-value
<b>Gender</b>					<0.001 <sup>b</sup>
Male	290	70.7	116 (40.0)	174 (60.0)	
Female	120	29.3	34 (28.33)	86 (71.66)	
<b>Age in year</b>					.051 <sup>a</sup>
18-24	38	9.3	17 (44.73)	31 (55.26)	
25-44	205	50.0	66 (32.19)	139 (67.08)	
45-64	157	38.3	60 (38.21)	97 (61.78)	
65+	10	2.4	7 (70.0)	3 (30.0)	
<b>Marital status</b>					0.652 <sup>a</sup>
Single	55	13.4	22 (5.36)	33 (8.04)	
Married	355	86.6	128 (31.21)	227 (55.36)	
<b>Education</b>					<0.001 <sup>a</sup>
No formal schooling	21	5.1	16 (3.9)	5 (1.2)	
Primary schooling	82	20.0	49 (11.95)	33 (8.0)	
Secondary schooling	153	37.31	59 (14.39)	94 (22.92)	
College	53	12.92	16 (3.9)	37 (9.0)	
University	101	24.63	10 (2.4)	91 (22.19)	
<b>Employment</b>					<0.001 <sup>a</sup>
Service holder	141	34.4	35 (8.53)	106 (25.36)	
Business	73	17.8	26 (6.34)	47 (11.46)	
Agriculture	84	20.5	52 (12.68)	32 (7.8)	
Unemployed	112	27.3	37 (9.02)	75 (18.26)	
<b>Religion</b>					<0.001 <sup>b</sup>
Islam	362	88.3	140 (38.67)	222 (61.32)	
Other	48	11.7	10 (20.83)	38 (79.16)	
<b>Family income in USD</b>					<0.001 <sup>a</sup>
Less than 100	124	30.0	52 (41.93)	72 (58.06)	
100-250	186	45.4	78 (41.93)	108 (58.06)	
More than 250	100	24.4	20 (20.0)	80 (80.0)	

<sup>a</sup>p-values from Chi-square tests

<sup>b</sup>p-values from Fisher's exact test

## Results

Out of a total of 410 respondents, the majority were male (70.7%) and age more than 30 years (78%). The mean age was  $40.39 \pm 11.44$  years. However, most of the respondents finished below secondary schooling (62.4%) and were Muslim (88.3%). Additionally, 34.4% of the respondents were service holder and 58.7% respondent's family income was less than 200 US dollar (USD). The mean income was  $218.06 \pm 177.41$  USD. Gender ( $p=0.016$ ), Education ( $p \leq 0.001$ ), religion ( $p=0.010$ ), occupation ( $p \leq 0.001$ ) and family income ( $p \leq 0.001$ ) showed a significant difference with exposure and non-exposure of passive smoking. Among the respondents, 63.41% were found non-exposed to passive smoking whereas 36.58% responded marked them to expose on passive smoking (Table 1).

Out of the 9 questions of knowledge on passive smoking exposure variable, tobacco smoke causes harm to a child and tobacco smoke exposure causes cancer were most agreed by 99.3% of the respondents. The second most agreed question was tobacco smoke exposure causes asthma by 98.8% respondents. The least agreed question was exposers of a healthy child on tobacco smoke does not have any effect by 47.1% of the

tobacco smoke does not have any effect ( $p=0.019$ ), tobacco smoke exposure causes cancer ( $p=0.048$ ), little exposure has no harm to a child ( $p=0.045$ ) and public smoking is ban in Bangladesh ( $p=0.006$ ) showed a significant difference with exposure and non-exposure of passive smoking (Table 2). The total mean score of knowledge on passive smoking exposure found  $6.45 \pm 1.07$ .

Regarding the perception on exposure of passive smoking among children, majority of the respondent from both gender agreed on smoking is harmful for children and parents responsibility to keep away children from tobacco smoking. However, law on smoking banning inside home ( $p=0.041$ ) was found significant difference with exposure and non-exposure of passive smoking (Table 3) and the total mean score of perception on passive smoking exposure found  $14.07 \pm 1.25$ .

## Discussion

In Bangladesh, there are very limited studies on passive smoking and the real picture of passive smoking exposure on children of the household related to knowledge and perception is not explored yet. The current study inspected participants' knowledge and

**Table 2** Correct knowledge on the exposure of passive smoking among children across gender

Knowledge items	Total, n=410		Male, n=290		Female, n= 120		P value
	n (%)	$\bar{X}$ (SD)	n (%)	$\bar{X}$ (SD)	n (%)	$\bar{X}$ (SD)	
Q1	407 (99.3)	.99 (.085)	288 (99.3)	.99 (.083)	119 (99.2)	.99 (.091)	.254
Q2	193 (47.1)	.47 (.500)	137 (47.2)	.47 (.500)	56 (46.7)	.47 (.501)	.019*
Q3	204 (49.8)	.50 (.501)	138 (47.2)	.48 (.500)	66(55.0)	.55 (.500)	.278
Q4	407 (99.3)	.99 (.085)	288 (99.3)	.99 (.083)	119 (99.2)	.99 (.091)	.048*
Q5	405 (98.8)	.99 (.110)	287 (99.0)	.99 (.101)	118 (98.3)	.98 (.129)	.259
Q6	340 (82.9)	.83 (.377)	242 (83.4)	.83 (.372)	98 (81.7)	.82 (.389)	.092
Q7	218 (53.2)	.53 (.500)	161 (55.5)	.56 (.498)	57 (47.5)	.48 (.501)	.045*
Q8	245 (59.8)	.60 (.491)	173 (59.7)	.60 (.491)	72 (60.0)	.60 (.492)	.006*
Q9	229 (55.9)	.56 (.497)	152 (52.4)	.52 (.500)	77 (64.2)	.64 (.482)	.138

\* Significant level at  $\leq 0.05$

Q1: Tobacco smoke cause harm to a child

Q2: Exposer of healthy child on tobacco smoke does not have any effect

Q3: Tobacco smoke exposure causes the respiratory problem of children

Q4: Tobacco smoke exposure causes cancer

Q5: Tobacco smoke exposure causes asthma

Q6: Tobacco smoke has only effect on sick children

Q7: Little exposure has no harm to a child

Q8: Public smoking is ban in Bangladesh

Q9: Selling smoking product under 18 years old is illegal

**Table 3** Perception regarding exposure of the passive smoking among children

Perception Items	Male, n=290				$\bar{X}$ (SD)	Female, n= 120			P value
	n(%)	n(%)	n(%)	n(%)		n(%)	n(%)	n(%)	
	Agree	Neutral	Disagree	Agree		Neutral	Disagree	$\bar{X}$ (SD)	
Q1	280(96.6)	5(1.7)	5(1.7)	2.95(.290)	117(97.5)	0(0.0)	3(2.5)	2.95(.314)	.548
Q2	249(85.9)	22(7.6)	19(6.6)	2.79(.544)	106(88.3)	8(6.5)	6(5.0)	2.83(.491)	.619
Q3	176(60.7)	68(23.4)	46(15.9)	2.45(.753)	78(65.0)	27(22.5)	15(12.5)	2.53(.710)	.625
Q4	269(92.8)	14(4.8)	7(2.4)	2.90(.369)	115(95.8)	3(2.5)	2(1.7)	2.94(.298)	.041*
Q5	280(96.6)	3(1.0)	7(2.4)	2.94(.322)	113(94.2)	3(2.5)	4(3.2)	2.91(.389)	.816

\* Significant level at  $\leq 0.05$

Q1: Smoking is harmful to children

Q2: Parents can protect their child from tobacco smoke exposure

Q3: Parents have the right to decide whether smoking is allowed in front of a child

Q4: Should have a law of smoking ban inside the home like public place banning

Q5: Parents responsibility to keep away children from tobacco smoking

perception of the exposure of the passive smoking effect on children. Almost all of the respondents (99.3%) recognized exposure to passive smoking is harmful to children. Global adult tobacco survey (GATS) report of 2017 found that the knowledge of the harmful effect of passive smoking among Bangladeshi is 93.1% [21]. The difference may be due to GATS data represented the whole country whereas, this study represented only a specific district. The finding is also in line with another study conducted among Vietnamese showed 83.8% had knowledge on the harmful effect of passive smoking [22].

This study also found that the knowledge regarding the passive smoking consequence of cancer and asthma is high among respondents. The previous study conducted in Bangladeshi adult's also found the same result [23]. This result is also reflected in the same line with the GATS data. Though, in this case, GATS data reflected the overall knowledge of tobacco smoking [21]. Another study in Pakistani women also found the association of high knowledge and lung diseases [24].

Surprisingly, this study found the knowledge regarding healthy child's exposure to passive smoking is low. It may due to this study conducted in the rural area and people of the rural area may not differentiate the tremendous health effect between the healthy and sick child. One of the studies from Brazil also reflected the 52% of the respondents did not believe that their children would suffer [25]. Additionally, the knowledge regarding smoking law was also found low. In Bangladesh, the practice of smoking law is not properly implemented and monitored which may be a cause of low knowledge on smoking laws [26].

The study finding also showed that the majority of the respondents agreed in the statements that smoking is harmful to children and parents' responsibility to keep away children from tobacco smoking. Additionally, introducing a government law to ban smoking inside the household found statistically significant. These results reflected that Bangladeshi people are aware of the effect of passive smoking and also agreed the importance of government law to reduce the rate of exposure rate. The

study also showed significant differences with different socio-demographic variables regarding exposure and non-exposure to passive smoking. Previous research found that male attitude is a significant barrier to reduce passive smoking exposure [10]. Besides that, another study conducted in Bangladesh found higher education is related to reduce exposure of passive smoking [23]. As Bangladesh is a Muslim country, previous study conducted in Bangladesh also emitted that Islamic rules can help to reduce exposure [27]. Additionally, former research confirmed that lower-income has a significant effect on increasing smoking exposure [28].

The study results have certain limitations. The study is cross-sectional in nature and all the variables were measured in a single point of time. Additionally, a self-administrative questionnaire were used which may lead to recall and reporting bias. Despite all the limitations, the research has its strength as it is the reflection of both smoker and nonsmoker populations which helped to get the actual picture of the research objective.

The study concludes that proper measurements need to be taken to improve the knowledge and perception among the rural community to reduce the exposure of passive smoking. An appropriate health promotion intervention needs to be implemented which will help to reduce the exposure rate of passive smoking among children.

#### Conflict of interest

There is no Conflict of interest by the authors.

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The research is a self-funding study.

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